

**What is claimed is:**

1 A maintenance system for machine tool, comprising: one or more user management apparatuses connected to numerical control sections of one or more machine tools each including a driving mechanism section, and said numerical control section which controls an operation of the driving mechanism section; and a manufacturer management apparatus disposed on a side of a manufacturer who manufactures said machine tools, said user management apparatuses and said manufacturer management apparatus being connectable to each other via an Internet, wherein

each of said user management apparatuses comprises:

user-side operation data storing means for storing data relating to an operating condition of said driving mechanism section of each of said machine tools; and

data transmitting means for collecting data relating to the operating condition of said driving mechanism section from said numerical control section, for accumulating the data into said user-side operation data storing means,

for checking whether a predetermined transmission condition is satisfied or not, and for, only when the transmission condition is satisfied, transmitting the operating condition data of said driving mechanism section accumulated in said user-side operation data storing means to said manufacturer management apparatus, in a data form of an electronic mail, and

said manufacturer management apparatus comprises:

manufacturer-side operation data storing means for storing operating condition data of said driving mechanism sections received from said user management apparatuses;

data receiving means for receiving the operating condition data of said driving mechanism sections transmitted from said user management apparatuses, and for updating operating condition data stored in said manufacturer-side operation data storing means with the received operating condition data;

consumption degree data storing means for storing data relating to a consumption degree of each of said driving mechanism sections;

consumption degree evaluating means for evaluating at any time the consumption degree of each of said driving mechanism sections, based on the operating condition data of said driving mechanism section stored in said manufacturer-side operation data storing means, and for updating consumption degree data stored in said consumption degree data storing means with the evaluated consumption degree data; and

alarm outputting means for monitoring at any time whether the consumption degree data stored in said consumption degree data storing means exceeds a predetermined reference value or not, and for, when the consumption degree data exceeds the reference value, outputting an alarm indicating this condition.

2 A maintenance system for machine tool, comprising: one or more user management apparatuses connected to numerical control sections of one or more machine tools each including a driving mechanism section, and said numerical control section which controls an operation of the driving mechanism section; and a manufacturer management apparatus disposed on a side of a manufacturer who manufactures said

machine tools, said user management apparatuses and said manufacturer management apparatus being connectable to each other via an Internet, wherein

each of said user management apparatuses comprises:

user-side operation data storing means for storing data relating to an operating condition of said driving mechanism section of each of said machine tools; and

data transmitting means for collecting data relating to the operating condition of said driving mechanism section from said numerical control section, for accumulating the data into said user-side operation data storing means, for checking whether a predetermined transmission condition is satisfied or not, for, only when the transmission condition is satisfied, generating transmission data based on the operating condition data of said driving mechanism section accumulated in said user-side operation data storing means, and for transmitting the generated transmission data to said manufacturer management apparatus, the transmission data having a configuration in

which a data element identifier defining an item relating to the operating condition of said driving mechanism section is related to the operating condition data corresponding to the item, and

said manufacturer management apparatus comprises:

manufacturer-side operation data storing means for storing operating condition data of said driving mechanism sections received from said user management apparatuses;

data receiving means for receiving the transmission data transmitted from said user management apparatus, for analyzing the data element identifier in the received transmission data, thereby recognizing an item relating to the operating condition of said driving mechanism section defined by the data element identifier, and for updating the operating condition data corresponding to the recognized item, stored in said manufacturer-side operation data storing means, with the received operating condition data;

consumption degree data storing means for storing data relating to a consumption degree of

each of said driving mechanism sections;

consumption degree evaluating means for evaluating at any time the consumption degree of each of said driving mechanism sections, based on the operating condition data of said driving mechanism section stored in said manufacturer-side operation data storing means, and for updating consumption degree data stored in said consumption degree data storing means with the evaluated consumption degree data; and

alarm outputting means for monitoring at any time whether the consumption degree data stored in said consumption degree data storing means exceeds a predetermined reference value or not, and for, when the consumption degree data exceeds the reference value, outputting an alarm indicating this condition.

3 A maintenance system for machine tool according to claim 1 or 2, wherein said data transmitting means is connected to the Internet only when the operating condition data accumulated in said user-side operation data storing means is to be transmitted to said manufacturer management apparatus, the operating condition data is then transmitted,

and, after the transmission is completed, the connection to the Internet is disconnected.

4 A maintenance system for machine tool according to claim 1 or 2, wherein the transmission condition is a condition which is set for an amount of data accumulated in said user-side operation data storing means, and

said data transmitting means compares the data amount accumulated in said user-side operation data storing means with a reference data amount serving as the transmission condition, and, when the accumulated data amount reaches the reference data amount, transmits the operating condition data accumulated in said user-side operation data storing means to said manufacturer management apparatus.

5 A maintenance system for machine tool according to claim 1 or 2, wherein the transmission condition is a condition which is set for a time period required for the data accumulation, and

said data transmitting means compares the time period required for the data accumulation with a reference time period serving as the

transmission condition, and, when the time period of the data accumulation exceeds the reference time period, transmits the operating condition data accumulated in said user-side operation data storing means to said manufacturer management apparatus.

6 A maintenance system for machine tool, comprising: one or more user management apparatuses connected to numerical control sections of one or more machine tools each including a driving mechanism section, and said numerical control section which controls an operation of the driving mechanism section; and a manufacturer management apparatus disposed on a side of a manufacturer who manufactures said machine tools, said user management apparatuses and said manufacturer management apparatus being connectable to each other via an Internet, wherein

each of said user management apparatuses comprises:

operation data storing means for storing data relating to an operating condition of said driving mechanism section of each of said machine tools;



data accumulating means for collecting data relating to the operating condition of said driving mechanism section from said numerical control section, and for accumulating the data into said operation data storing means;

consumption degree data storing means for storing data relating to a consumption degree of said driving mechanism section of said machine tool;

consumption degree evaluating means for evaluating at any time the consumption degree of said driving mechanism section, based on operating condition data of said driving mechanism section stored in said operation data storing means, and for updating consumption degree data stored in said consumption degree data storing means with the evaluated consumption data; and

consumption degree transmitting means for monitoring at any time whether the consumption degree data stored in said consumption degree data storing means exceeds a predetermined reference value or not, and for, when the data exceeds the reference value, transmitting information of the consumption degree in the

form of an electronic mail to said manufacturer management apparatus.

7 A maintenance system for machine tool according to claim 6, wherein said consumption degree transmitting means is connected to the Internet only when the information of the consumption degree is to be transmitted to said manufacturer management apparatus, the information of the consumption degree is then transmitted, and, after the transmission is completed, the connection to the Internet is disconnected.